

INPUT

MANAGEMENT

PLANNING PROGRAM

IN

FIELD SERVICE

FIELD SERVICE BRIEF

DEVELOPING USER ACCEPTANCE
OF NEW SERVICE TECHNIQUES

JULY 1983

MANAGEMENT PLANNING PROGRAM IN FIELD SERVICE

OBJECTIVE: To provide senior field service executives with basic information and data to support their management of the total field service activity.

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- Management Issue Reports - Six reports which analyze important new technical and management issues within the field service areas. Reports focus on specific issues that require timely attention by senior management.
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- Annual Field Service Research Program - A report that will present an in-house presentation to the company of the current year's research program and guidelines for the research program that will occur in the second half of the year.
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ABSTRACT

Users in Europe are wary of changes in traditional service techniques and of new methodologies. This INPUT brief examines user acceptance of new service techniques and ways of overcoming psychological barriers to remote diagnostics, central dispatch, carry-in/mail-in service, and customer-assisted maintenance. Users can benefit from these new techniques, as can vendors. Like other good field service concepts, these approaches have to be marketed well to succeed.

This report contains 65 pages, including 22 exhibits.

DEVELOPING USER ACCEPTANCE OF NEW SERVICE TECHNIQUES

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I INTRODUCTION

A. SCOPE

- This brief, entitled Developing User Acceptance of New Service Techniques, is one of a series of reports in INPUT's 1983 European Field Service Program. It addresses the concern felt by a significant number of vendors that users are not accepting new service techniques.
 - New service techniques, as discussed in this report, include:
 - Remote diagnostics.
 - Central dispatch.
 - Carry-in service.
 - Mail-in service.
 - Customer-assisted maintenance.
 - A detailed definition of these terms is included in section C of this chapter.

- The objective of this report is to provide an analysis of newer service techniques from which vendors may evaluate and formulate their strategies to raise their market acceptability and profitability. A profile of current and planned use of new service techniques by users and vendors is included. Also included are:
 - An assessment of user satisfaction and attitudes towards new service techniques.
 - An analysis of the benefits of new service techniques as perceived by users.
 - An evaluation of the major motivating and demotivating factors stated by users.
 - Suggestions for additional user requirements for new service techniques.
 - An outline of the managerial strategies currently employed to promote user acceptance of new service techniques.
 - Conclusions regarding the managerial/marketing formulas required to achieve success with new service techniques.
- Client comments and inquiries on the material contained in this report are welcome.

B. METHODOLOGY

- Research was conducted during May 1983 and included interviews with major computer and data processing equipment vendors and with leading-edge users

of computer and data processing equipment. The interviews were usually conducted with field service managers and directors with country or European responsibility and data processing managers and directors and operations managers.

- Vendor interviews were conducted on-site and by telephone.
 - On-site interviews lasted up to three hours, while telephone interviews averaged one hour.
 - User interviews were conducted by telephone and by mail, with telephone interviews averaging one hour.
- Nineteen user and vendor interviews were conducted throughout Europe, either on-site or by telephone.
- One hundred and seventy-five users throughout Europe replied to a mailed questionnaire.

C. DEFINITIONS

I. REMOTE DIAGNOSTICS

- Remote diagnostics is a tool field engineering staff use in fault detection, debugging, and system checking from a remote site by the use of telephone lines and/or data links.
 - True remote diagnostics involve the ability to replace the on-site console with a remote device and to exercise the system as if on-site. Remote diagnostics may require the whole system or run under an operating system.

- A remote diagnostic centre is a location where a group of engineers with the ability to remotely diagnose a number of systems reside.
 - Dumb remote diagnostics involves the ability to inspect the system and mainly involves error logs without the option of running diagnostic tests.
 - Intelligent remote diagnostics involves the ability - by the use of a remote intelligent device - to inspect the system logs, run diagnostic checks, locate component failures, and direct and assist on-site engineers in fault finding. An operator instigates and controls the operation.
 - Remote computerized diagnostics is an extension of intelligent remote diagnostics in which a computer takes the part of an operator and carries out the control functions following predetermined logical steps in diagnostic checking and fault finding.
- INPUT asked customers for their interpretations of remote diagnostics. A sample of their replies includes:
 - "The ability to carry out diagnostics when a breakdown occurs, without interfering with the system."
 - "Ability to down-line using a telephone line."
 - "Semipermanent link between machine and remote machines for diagnosis of faults."
 - "It is used when we have problems with machines. User can phone Stockholm or Paris for problem solution. Have IBM retain system."

- "Diagnosis from remote location of equipment elsewhere."
- "Ability of remote site to contact host computer and call up menu of information stored."
- "A tool available at other end of line whereby machinery can be checked regularly. IVB remedial metric is entirely different."
- "Prevention of hardware and software faults."
- "Remote computers linked to technical centre at Rouen where the host computer can intervene in order to isolate problems."

2. CENTRAL DISPATCH

- Central dispatch is a procedure whereby the customer reports a fault or problem to a central location. Such a contact initiates action from the vendor to repair, restore, or explain the problem, whether remotely or with an on-site visit.
- The central dispatcher is the person who finds the resources to address faults and problems. Often times, after logging the problem into the vendor's system, the dispatcher will order field engineers to the site by use of radio phones or telephone beepers.
- The dispatch function can also be used for interfacing with other technical and logistics resources including software support and spare parts and repair operations.
- Central dispatch can be performed using manual or automated systems.
- Customers were asked to define, in their own words, the meaning of central dispatch:

- "Operates at level of engineering dispatch, i.e., telephone contact with engineer and immediate response. We have to increase the central dispatch service so that it will operate throughout France and not be available just in Paris."
- "Central office isolated from main centres used for receipt and dispatch of orders."
- "Ability to send or convert a status within a software status. Used for transmission and conversion of data."
- "Don't understand this term."
- "Central point that users call to report problems and allocate engineers."
- "Not available in Sweden. Have technical service agreement with Honeywell locally. Now aware of central dispatch."
- "Need to be in central location with expertise."
- "Telephone central dispatch to dispatch engineer and parts. Centre is 15 km from client, and engineer arrives within 20 minutes."
- "Sends out spare parts and engineers from central location. Can actually take parts to central dispatch at Rouen."

3. CARRY-IN SERVICE

- This service is an option provided by either the local dealer, the regional/national distributor, or the third-party maintenance vendor through repair depots.

- In exchange for delivering failed equipment to the repair centre, the end user receives:
 - Lower service charges than on-site maintenance.
 - Faster turnaround time than mail-in service.
 - An opportunity to negotiate the payment of repair (according to the user's view of who is responsible).
- An increasingly large number of dealers supply their own service, but the success of this approach is questionable.
- Customer definitions of carry-in service include:
 - "The geographical region is to be extended and distance to nearest maintenance centre could be reduced."
 - "Roving engineers who call in to check for faults."
 - "Don't fully understand. Do use in context of leaving in terminal for repair."
 - "Not available in Sweden though believe IBM has made it available in OSB. Ability to take parts in for repair."
 - "Facility not available unless RD also used. Limited availability to highly skilled data processing personnel."
 - "User takes part for repair to vendor."

4. MAIL-IN SERVICE

- Limited to users able to diagnose their own equipment failures, mail-in service provides a turnaround time of one to two weeks. The defective parts are removed and replaced by the system's owner.
- An extension of this practice is the large corporation that purchases many personal computers and services its own "installed base" through a small, dedicated staff of engineers. Diagnosis and part-swapping are done by the service group, which obtains repairs by mail from established vendor depots.
- Costs are limited to basic diagnostics (both software and hardware tools), a limited supply of commonly needed spares (to reduce repair time), and shipping costs.
- This type of service is popular with start-up vendors (new suppliers of the personal computer market) and is usually replaced by repair depot or dealer/distributor service as soon as possible.
- Customers provide some interesting and sometimes ill-informed interpretations of this service:
 - "Ability to send parts, etc., for repair."
 - "Swap boards, etc., and send in for repair."
 - "Sends part for repair to vendor via taxi/courier."
 - "Can send in parts. Dependence on SERNAN (SNCF freight service) versus good overnight service."
 - "Diagnostics from machine posted to central office."

5. CUSTOMER-ASSISTED MAINTENANCE

- Customer-assisted maintenance is a term used for partial servicing of equipment by the customer, regardless of the task, while the equipment is still under a maintenance agreement. Customer-assisted maintenance as a newer service technique is not the same as self-maintenance where no maintenance agreement exists between user and vendor except for an occasional one for backup support, parts, documentation, and the like.
- Customer-assisted maintenance has also been called co-active maintenance and participatory maintenance.
- Users, asked to define customer-assisted maintenance, came up with some interesting replies, closely related to remote diagnostics:
 - "Customer takes diagnostics, deciphers and contacts service centre for service engineer who would be dispatched with parts. Mainly occurs where faults are not corrected on the spot."
 - "Don't know. Not familiar with it as a formal device. Although informally client discussed problem with engineer."
 - "After calling central dispatch, technician and user diagnose the problem by telephone contact."
 - "Customer diagnoses where fault is (i.e., screen, logic, or keyboard)."
 - "Engineers run diagnosis and do preventive maintenance. If fault is detected, four-hour response."
 - "Telephone instructions are routine for checking faults."

II EXECUTIVE SUMMARY

A. CONCLUSIONS

- Most (71%) European Field Service organizations currently offer new service techniques as shown in Exhibit II-1. Central dispatch is the most popularly used technique followed by remote diagnostics, mail-in, customer-assisted maintenance, and carry-in. By 1988, 82% of maintenance vendors will have incorporated new service techniques into their operations.
- New service techniques are developed by vendors for a single purpose: to reduce costs and increase efficiency of maintenance operations, and to maintain a competitive edge. Coincidentally, these new techniques can reduce customers' downtime and/or increase his confidence in the service product.
 - Generally, vendors have performed admirably in developing new service techniques, but they have not been as successful in implementing them.
 - Typically, service organizations have excellent ideas that are developed into useful products and services. The significant shortcoming in service groups is their inability to effectively sell these ideas internally and externally.
 - The missing factor is marketing. Reasons for this omission are simple and understandable. Field service, by its traditional nature, is not

EXHIBIT II-1

CURRENT AND PLANNED AVAILABILITY OF NEW SERVICE TECHNIQUES

	REMOTE DIAGNOSTICS	CENTRAL DISPATCH	CARRY- IN	MAIL- IN	CUSTOMER- ASSISTED MAINTENANCE	AVERAGE
Current	78%	89%	44%	78%	67%	71%
Planned	11	0	22	11	11	11
Total	89%	89%	66%	89%	78%	82%

Percentage of Vendor Respondents

marketing or sales oriented. Service and sales are made up of entirely different motivations and personalities, which result in varying degrees of misunderstanding and even animosity between them.

- In spite of service groups' resistance to selling, it is essential that they do so to survive. The art of selling involves communicating, promoting, pricing, convincing, and closing.
 - Communicating means understanding customers and their needs while articulating your own ideas.
 - "Customers" can be internal, i.e., the sales department, as well as end users.
 - Sales communication is aimed at filling the needs of both buyer and seller.
 - An obvious shortcoming noted from this research is the failure of field service to communicate the benefits of new service techniques to their customers.
 - Communication is the initial and most critical step in the sales process. This and other selling factors are discussed in section B of this chapter, Recommendations.

I. REMOTE DIAGNOSTICS

- Remote diagnostics is clearly a concept designed by vendors to eliminate or reduce the most expensive part of service - going to the site. According to various service managers, remote diagnostics eliminates 8% to 40% of site visits, depending on the product, customer attitudes, and remote diagnostic resources.

- Not all products lend themselves to remote diagnostics. Also, proximity to service centres affects their use.
 - For example, a large network involving nodes in several distant areas is a much better candidate for remote diagnostics than a single word processing printer in a local office.
 - Likewise, if a major problem develops within one to five miles of a service office, the customer may fail to see the logic in using remote diagnosis.
- Customers need to understand the benefits of remote diagnostics to accept it as a new service technique. This means that they need to first know what it is.
- An excellent example of a vendor (Honeywell) selling the benefits of remote diagnostics was a series of full-page advertisements in the London Times and other publications. The text read:
 - How many computers do you know that can mend themselves over the phone?
 - Computers do break down.
 - (Even ours, which we believe are the most reliable computers on the market.)
 - So what you need is the most efficient computer repair service around.
 - Ours again.

- If something goes wrong with your Honeywell Computer, simply give us a ring.
 - . If it's got a software problem, we can install a "patch" over the phone.
- If it's a hardware fault, our telephone diagnosis can shorten the repair time considerably.
- This service has given our users thousands of hours of extra computer use.
- And when you buy a computer for your business, there's a basic equation you have to take into account.
 - . Time = money.
- Honeywell is the only company to supply this service across a full range of computers - everything from minis to mainframes.
- So call us on 01-568-919 (ext. 471), and we'll tell you more about how Honeywell Computers can mend themselves over the phone.
- After one phone call, you'll feel a lot better yourself.
- A computer should be the end of your problems, not the beginning. Honeywell.
- About 25% of the ad space is a picture of a left hand holding a telephone with a screwdriver sticking out of the earpiece.
 - Rather grotesque looking, but it catches the eye.

- It makes you want to read the text.
- Honeywell field service people are very proud of their remote diagnostics and think it is the best in the business. They have therefore taken an important step in communicating the benefits of their product.

2. CENTRAL DISPATCH

- Central dispatch is very closely related to remote diagnostics since it is necessary for the customer to phone the problem into the service vendor prior to receiving any assistance, regardless of whether it is remote or on-site. The benefits of central dispatch are more obvious to the customer.
 - He has to communicate a problem to the vendor at some point.
 - Vendors normally provide a free phone number, eliminating the cost of calling.
 - "Central" dispatch allows the customer to believe that he is calling into a constantly well-staffed headquarters with ample resources at all levels to get problems solved in the least amount of time.
- But this study and other recent INPUT research reveal that large central dispatch functions can be a turn-off. When calls are frequently answered by different dispatchers, it reduces the personal touch, and that personal touch is very important to customers.
 - They enjoy calling the same person for all problems.
 - The dispatch operators build up a tremendously important relationship over the phone.

- On the other hand, a different voice each time creates anxiety with customers because they believe unknown operators won't understand or tend to their needs as well and as quickly as familiar ones. Consequently, some service firms have established "local" central dispatch functions to reinforce or restore the personal touch.

3. CARRY-IN AND MAIL-IN SERVICES

- Carry-in and mail-in services are virtually identical with the exception of the courier or deliverer of the broken or repaired unit to and from the site and the repair centre. Diagnostics usually and repairs always are conducted off the customer's premises.
 - Couriers can come from several sources:
 - . Users' personnel.
 - . Dispatch services.
 - . Vendors' personnel.
 - . Post office carriers.
 - A problem exists in properly packaging faulty equipment for return to repair centres.
- These service techniques became popular with vendors of portable equipment and especially with microcomputers. Maintenance revenues for this type of equipment are competitively restricted and do not normally cover on-site service.
 - It is becoming increasingly evident in Europe that the microcomputer user is a potential hazard to hard-earned profits from systems maintenance.

- The micro user, in many reported instances, is more demanding than a large systems user. This is particularly so when the microcomputer is interconnected to the corporate computer system.
- The main problem is the microcomputer user's lack of knowledge of computers, applications, and so forth. The tendency to call for service, perhaps unnecessarily, is greater.
- In an attempt to control extraordinary demands on field service resources and to eliminate the most expensive aspect of service, the site visit, walk-in or carry-in and mail-in options were developed. In the U.S., IBM's only means of service for its personal computer was walk-in or mail-in, initially.
 - If the customer did not want to get involved with either method, IBM, for an extra fee and only if the problem was within 30 miles from a service centre, would come to the site and pick up the broken unit.
 - Repairs were accomplished at authorized agencies (e.g., Sears Roebuck) or IBM service centres of their main repair depot at Greencastle, Indiana.
- Again, the rationale for vendors' offering the service is clear. The benefits to the user, and therefore his willingness to opt for carry-in or mail-in service, is limited.
 - The reaction by IBM Personal Computer users in the United States was so negative towards carry-in and mail-in that on-site service was made available, at a premium price.
 - Was this strategy of creating the demand for on-site service for the personal computer a preconceived IBM strategy?

- Carry-in and mail-in services have a very obvious advantage to the customer. By bringing the problem to the vendor's repair facility, the cost of service can be reduced by as much as 45%. Yet customers still cling to traditional service.
- One attractive enhancement to customers is the provision for a loaner unit to replace the broken unit while it is repaired.

4. CUSTOMER-ASSISTED MAINTENANCE

- Customer-assisted maintenance, as a new service technique, has the greatest amount of risk and reward in implementation. The rewarding aspect to vendors is that, by implementing customer assistance for service, expenditures can be minimized while revenues for that service can remain profitably and disproportionately high.
- The danger or risk to the vendor in developing customer-assisted maintenance is that a technically competent and confident customer may become so skilled at "assisting" in service that he may cancel his maintenance contract and use the service vendor only for emergency backup and spare parts.
- Customers who accept this option are limited to those who feel they have the technical knowledge to get involved. This narrows the market considerably. Also, assisting customers are keen to receive suitable pricing adjustments (discounts) from vendors. The amount of discount is variable based on local conditions.

B. RECOMMENDATIONS

- Marketing programs are urgently required for vendors offering remote diagnostics, central dispatch, carry-in/mail-in, customer-assisted maintenance, and other new service techniques.

- It is essential to understand customers' needs vis a vis vendors' requirements and resources relating to new services.
- Communicating and promoting the benefits of new services to customers is especially important since user attitudes originate in vendors' organizational approaches to and communications about new service techniques.
- Communicating benefits can be achieved formally or informally through personal visits or letters to the customer. Promotion can be effectively implemented, as in the Honeywell ad previously mentioned, through advertising. Examples of current methods used by vendors include:
 - Remote diagnostic centres.
 - Association of Field Service Managers (AFSM) conferences.
 - Trade conferences.
 - User group discussions where various groups are organized according to the application areas.
 - Newsletters on field service operations.
 - Advertisements.
 - User surveys aimed at (1) market segmentation and (2) user satisfaction analysis.
 - Education and training, specifically, user-friendly diagnostic "menus" for secretaries.

- Accurate and thorough contracts.
 - Brochures.
 - Videos.
 - Visits to technical centres.
- Other aspects that should be included are:
 - Customer relations skills training.
 - Telephone skills training.
 - Involvement of field engineers in the sales process to properly set users' expectations.
- Users' perceptions of service performance and responsiveness must be managed by vendors, stressing the benefits of new service techniques:
 - Cost reduction to the customer for the new service options.
 - Reports on efficiency systems, e.g., reduced downtime, response times, speed of repair (i.e., exploiting the data collection potential of remote diagnostics).
- Pricing and selling are integral aspects of the total marketing mix. In order to sell effectively, pricing strategies need to be thought out. Market research into specific customers or prospects is required.
- Apart from marketing communications and promoting newer services, vendors need to consider customer training courses in newer services. These courses, as in training field engineers, can be produced in several ways:

- Classroom instruction.
 - Seminars.
 - Manuals.
 - Audio/visual presentations.
- INPUT believes that these recommendations will increase the demand for remote diagnostics, central dispatch, carry-in/mail-in, and customer-assisted service. Further investments in time, resources, and cash will be required. Having made or committed to investment in new services, the costs of marketing them are justified.

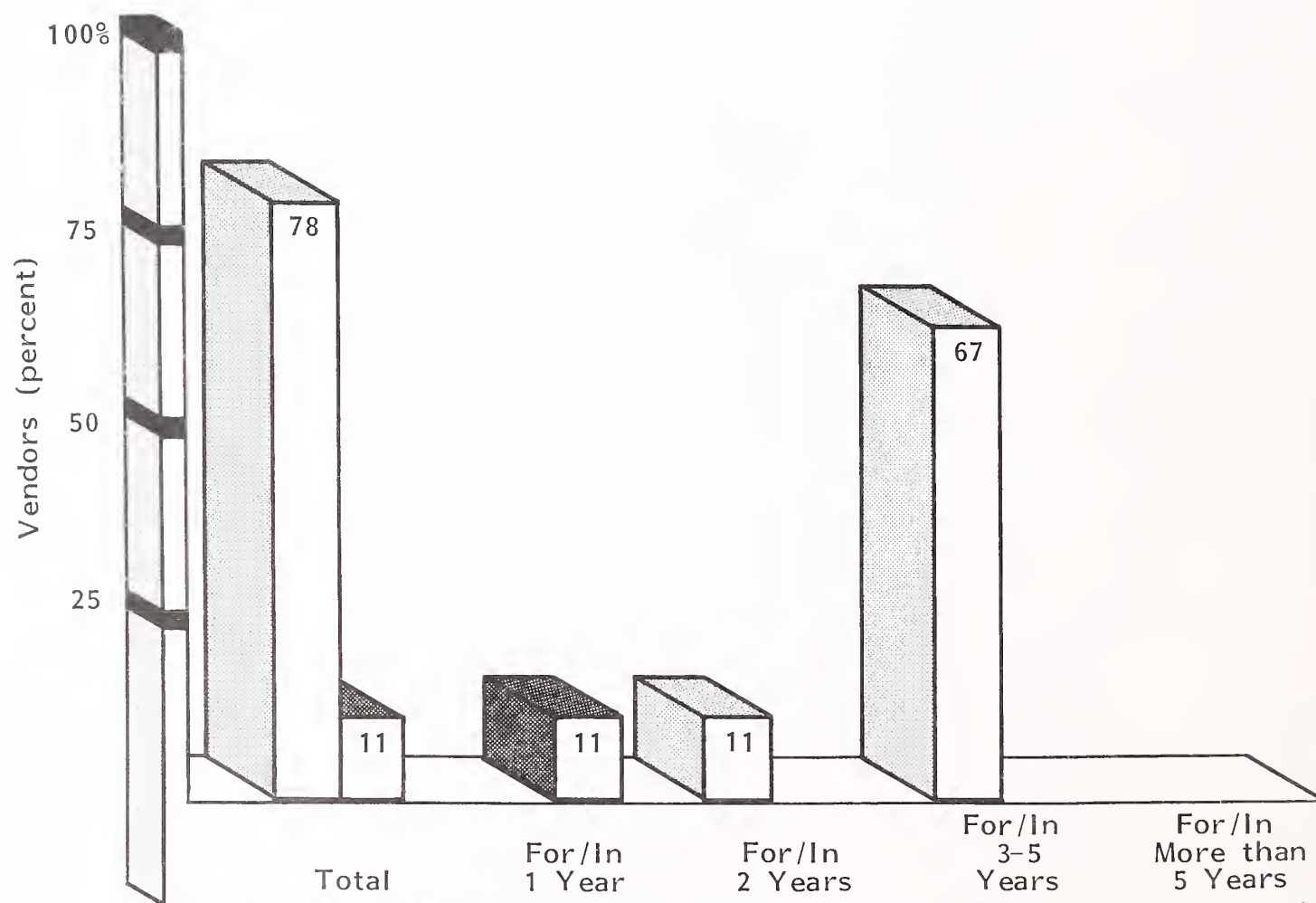
III NEW SERVICE OFFERINGS: A COMPARISON OF USER AND VENDOR PERCEPTIONS

A. AVAILABILITY

- Exhibits III-1 through III-5 show that a high percentage of vendors currently provide new service techniques. The current average level of 71% is expected to increase to an average of 82% by 1987. Remote diagnostics and central dispatch are the attractive new service techniques for development by vendors within the next three to five years.
 - Vendors have established these new service elements to make their operations more efficient and to reduce costs.
 - Those vendors who have developed remote diagnostics and central dispatch have created a certain peer pressure with other vendors.
 - The major controlling factor of the growth rate is customer acceptance.
- Mail-in and customer-assisted maintenance have a slower growth rate than remote diagnostics and carry-in, but will reach similar levels by 1988. These techniques are popular with most vendors, but there is less demand from users.

EXHIBIT III-1

VENDORS PROVIDING REMOTE DIAGNOSTICS



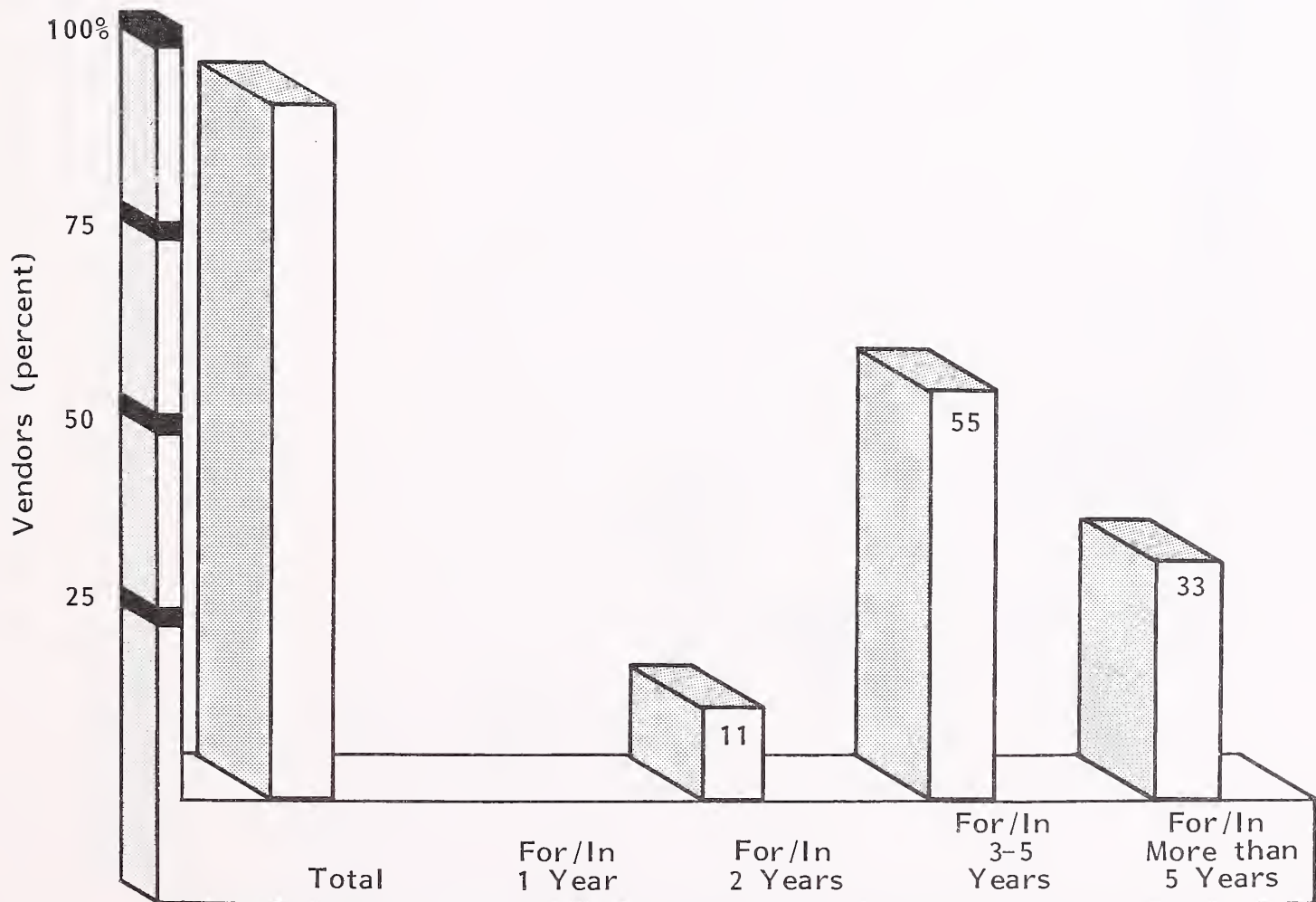
Currently Providing



Planning to Provide

EXHIBIT III-2

VENDORS PROVIDING CENTRAL DISPATCH



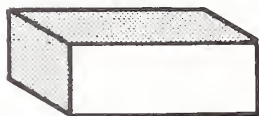
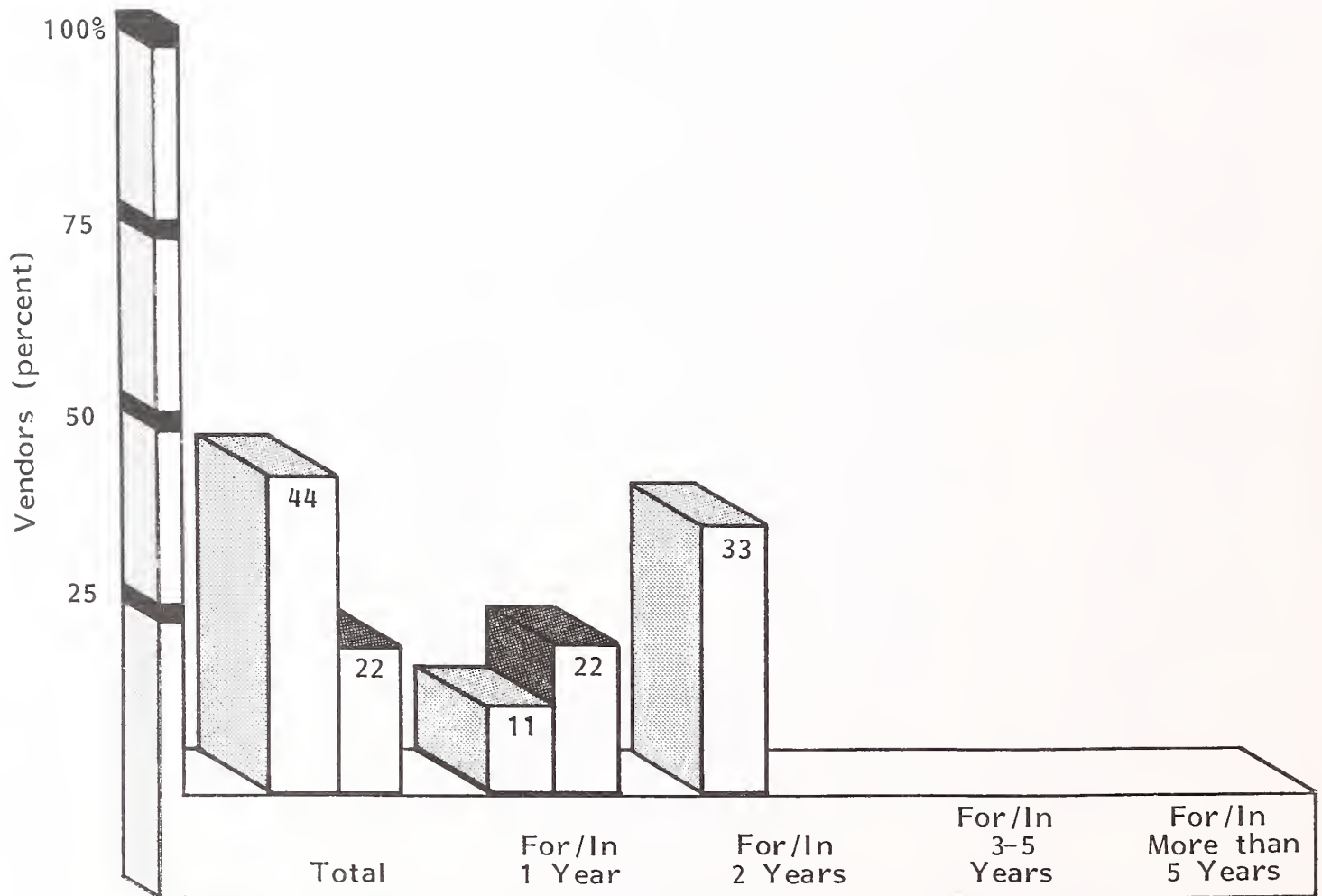
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Planning to Provide

EXHIBIT III-3

VENDORS PROVIDING CARRY-IN SERVICE



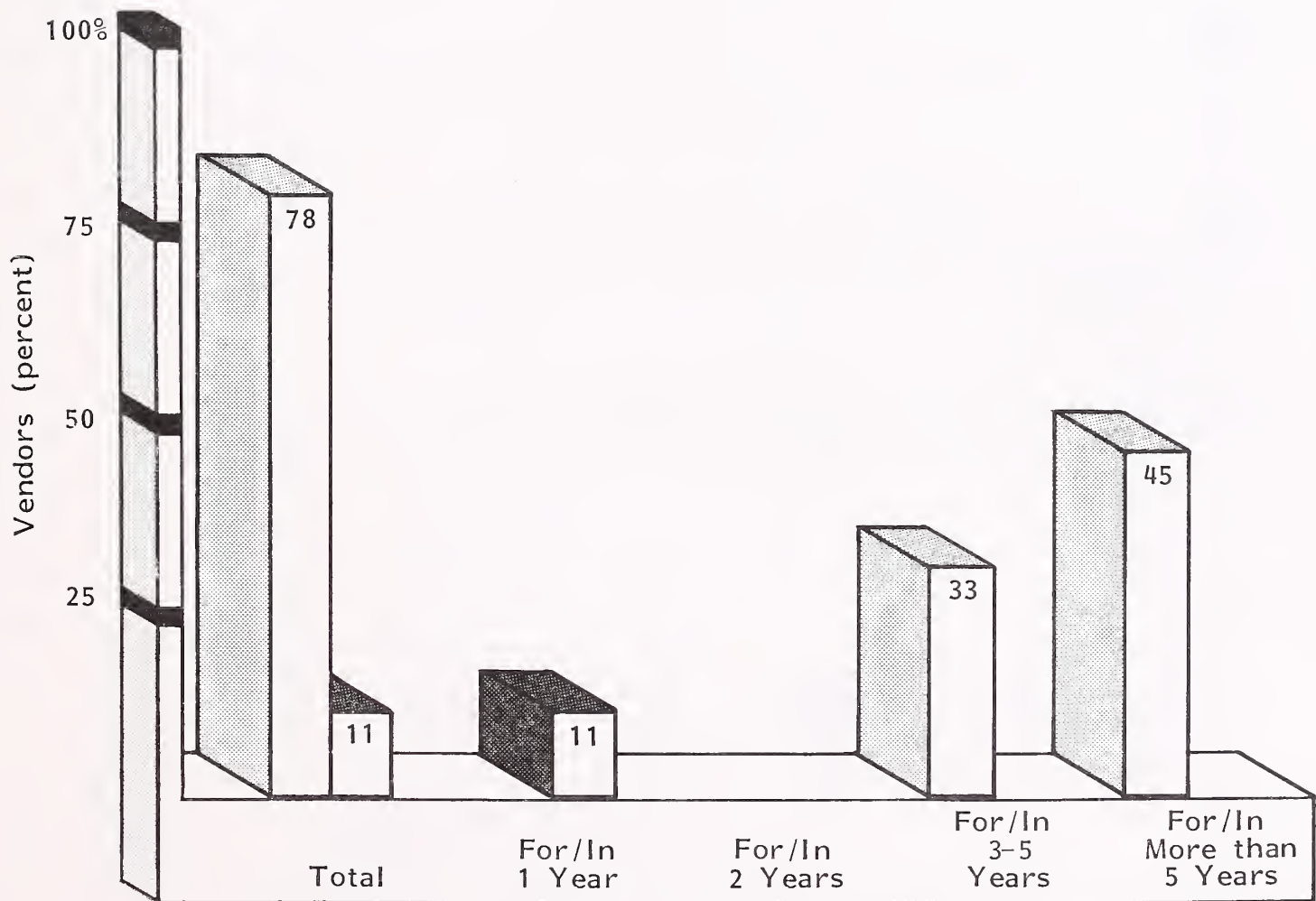
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Planning to Provide

EXHIBIT III-4

VENDORS PROVIDING MAIL-IN SERVICE



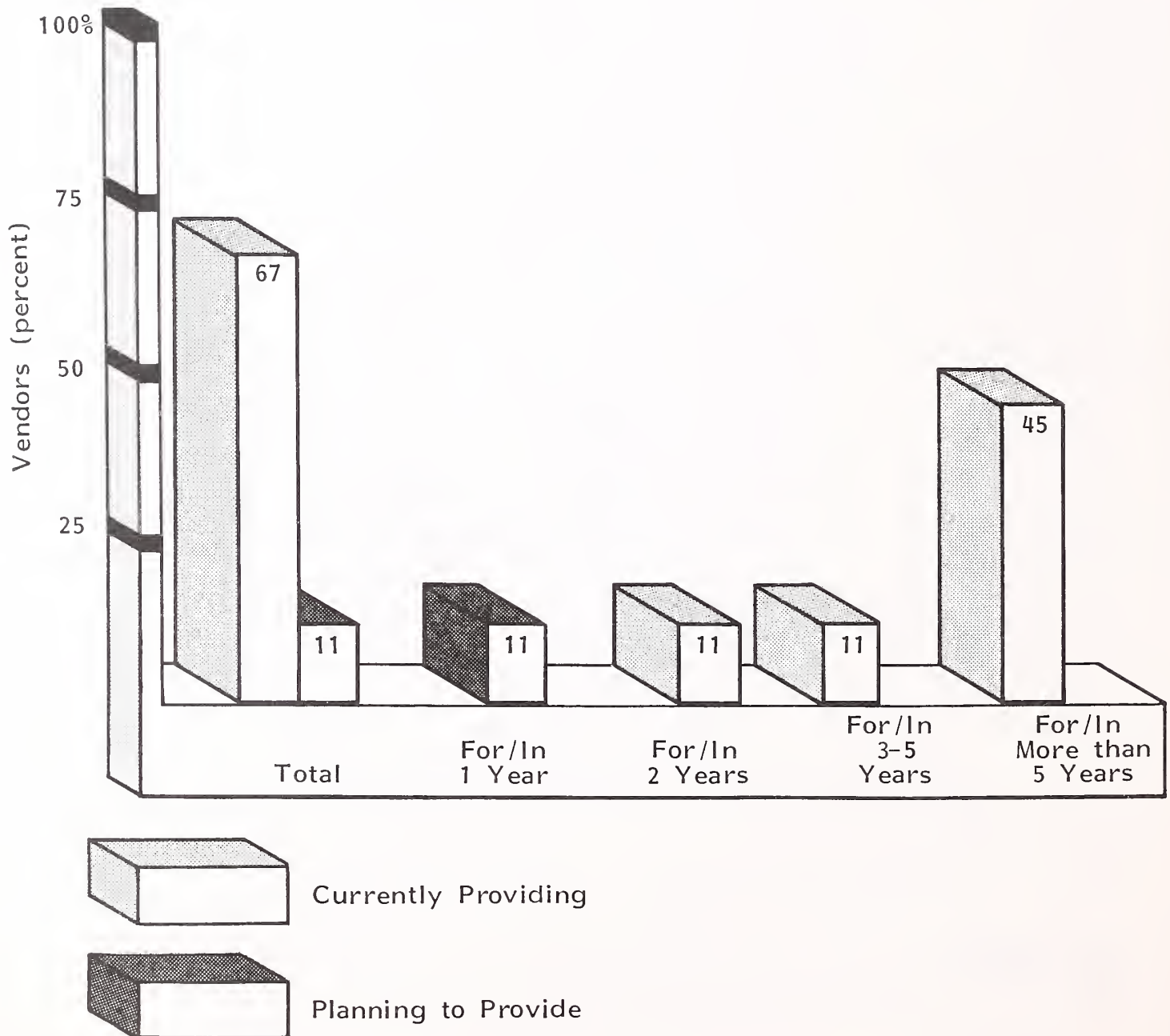
Currently Providing



Planning to Provide

EXHIBIT III-5

VENDORS PROVIDING CUSTOMER-ASSISTED MAINTENANCE



- Carry-in services are considerably less available than the other services, but a 22% increase in availability will boost the level to 33% by 1985. A similar increase from 1985 to 1988 would bring carry-in up to a similar level as the other services. This reflects an anticipated transformation of commercial to consumer behaviour.
- Central dispatch is currently the best-established new service, followed by remote diagnostics and mail-in, then customer-assisted maintenance and finally carry-in.
- This ranking reflects the evolutionary development of field service and the interdependence of the new service techniques.
- Furthermore, the lower availability level of carry-in services reflects the non-modular, nonportable nature of much of the installed base of information processing equipment.
- Additional new services are planned or currently provided by vendors. These services are defined in the Appendix and include:
 - Site surveys.
 - Site planning.
 - Communications consulting.
 - Installation planning.
 - Repair contracts with guaranteed turnaround time.
 - User diagnostic training.
 - Third-party maintenance.

- Supplies and parts sales.
- The trends toward repair contracts with guaranteed turnaround, user diagnostic training, third-party maintenance and supplies and parts sales are, in many respects, associated with or are spin-offs of the new service techniques under discussion.
- Exhibit III-6 illustrates vendor reasons for not providing new service techniques. When these reasons are categorized more closely, they fall into four groups:
 - Organizational.
 - "Not endorsed by parent company."
 - "Too complicated. High cost."
 - Product.
 - "Too wide a range of products."
 - "Products too large or bulky."
 - Implementation.
 - "Not covered in contract."
 - "Products not easily disassembled."
 - "Risk of damage."
 - User.

EXHIBIT III-6

REASONS FOR NOT PROVIDING SERVICES

Remote Diagnostics	Central Dispatch	Walk-in	Mail-in	CAM	REASONS
X		X			Too wide a range of products
X					Parent company hasn't endorsed it
	X				Local staff responsible for customer relations
		X			Not covered in contract
		X	X		Products too large or bulky
		X		X	Clients prefer on-site engineer
		X	X		Damage risk
				X	Products not easily disassembled
				X	Too complicated
X					High cost

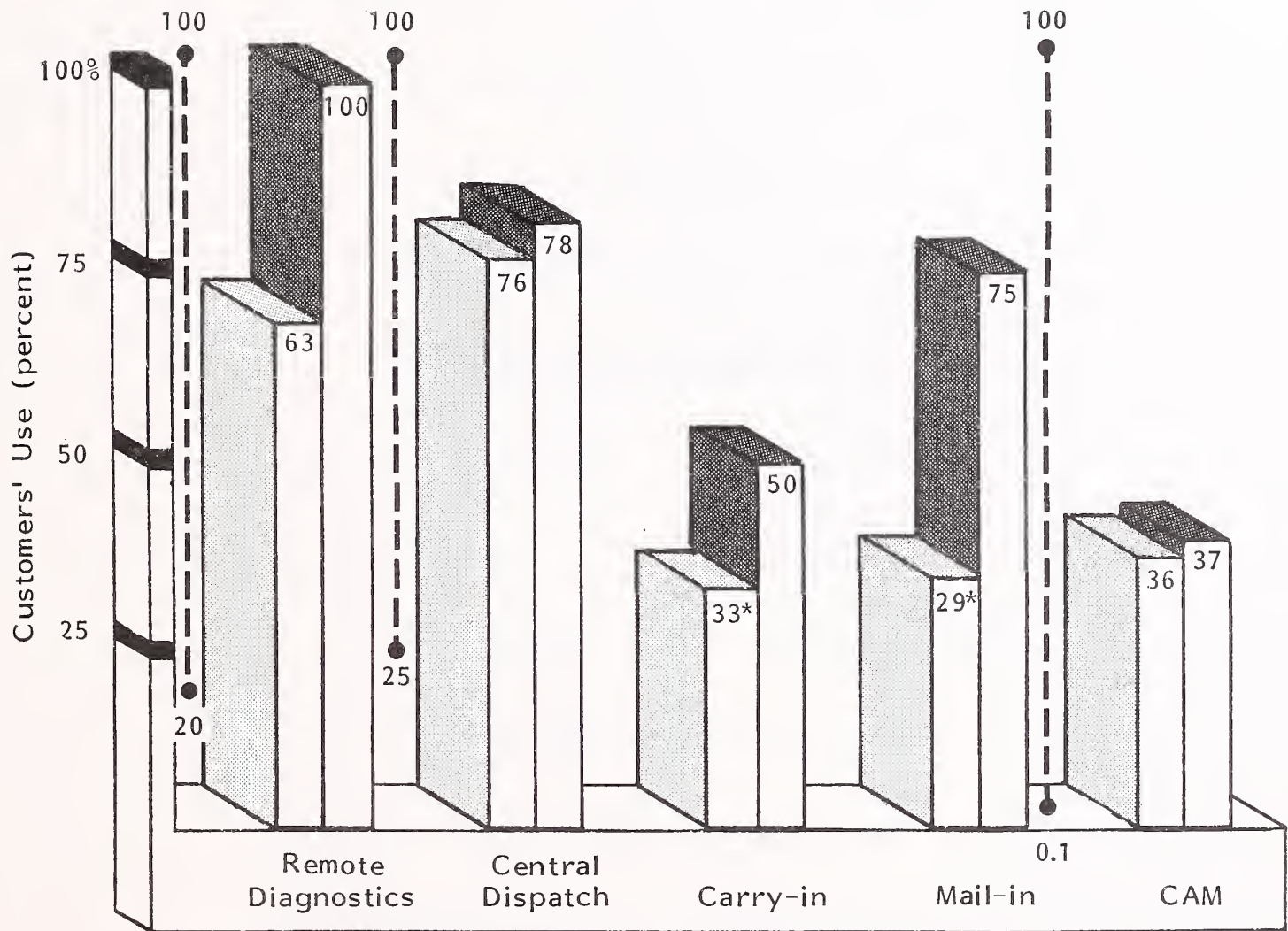
- . "Local staff are responsible for customer relations."
- . "Clients prefer on-site engineer."
- These responses highlight the problems vendors have to overcome to achieve success with new maintenance techniques.
- It should be noted that during the planning for these services and in deciding not to proceed with their implementation, no real constructive effort was made by vendors to determine user requirements and attitudes. The motivation was efficiency (cost reduction).

B. USER ACCEPTANCE OF NEW SERVICE TECHNIQUES

- Exhibit III-7 illustrates the levels of use of new service techniques as perceived by vendors. A ranking of the current use of services reveals that central dispatch is the most widely used service (76%), closely followed by remote diagnostics (63%). Then there is a significant drop, with very little difference between customer-assisted maintenance (36%), carry-in (33%), and mail-in (29%).
 - When asked what the level of use of their services should be, vendors cited considerably higher expectations for remote diagnostics (100%), mail-in (75%), and carry-in services. The increases they hoped for were 37%, 46% and 17% respectively.
 - These deviations underline vendors' dissatisfaction with the level of use of new services.

EXHIBIT III-7

CUSTOMERS' USE OF SERVICES



Actual



Should Be



Actual Range

* For users with portable equipment, range is 0 - 100%

- Vendor expectations of minimal (1-2%) increases in the use of central dispatch and customer-assisted maintenance suggest that they have implemented those services pretty much as planned. The possibilities may be limited by the type of equipment installed in the customer base or problems blocking further use of those services.
- A comparison of current use and vendor expectations shows that the ranking of service usage varies.
 - Current ranking:
 - Central dispatch - 76%.
 - Remote diagnostics - 63%.
 - Customer-assisted maintenance - 36%.
 - Carry-in - 33%.
 - Mail-in - 29%.
 - Expected ranking:
 - Remote diagnostics - 100%.
 - Central dispatch - 78%.
 - Mail-in - 75%.
 - Carry-in - 50%.
 - Customer assisted maintenance - 37%.

- Mail-in and carry-in are under utilized according to vendors.
- A further comparison between the availability of the services and their use mirrors the level of under utilization of mail-in and carry-in noted above, but also includes a very high level of under utilization of customer-assisted maintenance which does not appear to perturb the vendors.
- Availability rank:
 - Central dispatch - 89%.
 - Remote diagnostics - 78%.
 - Mail-in - 78%.
 - Customer-assisted maintenance - 67%.
 - Carry-in - 44%.
- Use:
 - Central dispatch - 76%.
 - Remote diagnostics - 63%.
 - Customer-assisted maintenance - 36%.
 - Carry-in - 33%.
 - Mail-in - 29%.
- Understandably, the most under-used services - mail-in, carry-in and customer assisted maintenance - are those that require user participation/involvement.

- Vendors believe that users' reluctance to accept new services is due to inertia, education, resistance to change, and lack of familiarity with maintenance, as shown in Exhibit III-8. These problems are common to all sales situations.
 - It is possible that these objections have become exaggerated blocks to vendors because field engineers are not taught how to sell and hence how to handle objections.
 - These are problems of user perception and expectation, which may be controlled by vendors if handled correctly.
- Users do not concur with vendors, as shown in Exhibit III-9. The reasons users give for not using new services do not reveal reluctance towards using services. Rather, they emphasize that these services are not available to them.
 - There is a lack of appropriately skilled personnel in their organizations.
 - They have difficulties in understanding the new services; e.g., there is a lack of clear guidelines on responsibility (carry-in, mail-in, customer-assisted maintenance), and formalized procedures.
- Indeed the case appears to be that users are willing to participate in new service techniques if only the vendors would clearly define user roles and responsibilities.
- This viewpoint is borne out by the results of separate user research consisting of 174 respondents representing the United Kingdom, France, Germany, Italy, Scandinavia and Benelux. Overall their attitudes were very positive towards participating in new service techniques. Except in France and Germany, users are very willing to diagnose, swap boards, patch software, and carry in portable equipment.

EXHIBIT III-8

VENDORS' PERCEPTIONS OF USERS' RELUCTANCE TO USE SERVICES

Remote Diagnostics	Central Dispatch	Walk-in	Mail-in	CAM	REASONS
X	X	X	X	X	Hard to educate customers, inertia, resistance to change, lack of familiarity with maintenance
X					Security
X					Perceived devaluation of service
				X	Disparity between decision makers involved with profits and computer operations

EXHIBIT III-9

REASONS FOR NOT USING SERVICES - USERS

Remote Diagnostics	Central Dispatch	Walk-in	Mail-in	CAM	REASONS
X					Not available for small machines
X	X				Not skilled enough
X	X	X	X		Not available from vendor
X					Unnecessary - not remote
		X	X	X	Problems of responsibility
			X		Potential damage
				X	Needs to be more formalized (discount)

- In order to validate these user viewpoints, Exhibits III-10 to III-14 illustrate user experience of new techniques. Current use is as follows:
 - Remote diagnostics - 55%.
 - Central dispatch - 44%.
 - Carry-in - 11%.
 - Mail-in - 55%
 - Customer-assisted maintenance - 67%.
 - Average - 46%.
- It is important to emphasize that the typical vendor viewpoint is based on vendor considerations rather than user considerations. Vendors are making the fundamental error of not considering user requirements, and there is an obvious lack of market research. It is possible that this lack of understanding of user requirements has caused the mixed reception that vendors feel new service techniques have received.
- The positive result of these observations is that the situation can be turned around. Market research into user requirements, services that incorporate solutions to user needs, and a stronger emphasis on user education should definitely increase user acceptance of new service techniques.

EXHIBIT III-10

CUSTOMERS' USE OF REMOTE DIAGNOSTICS

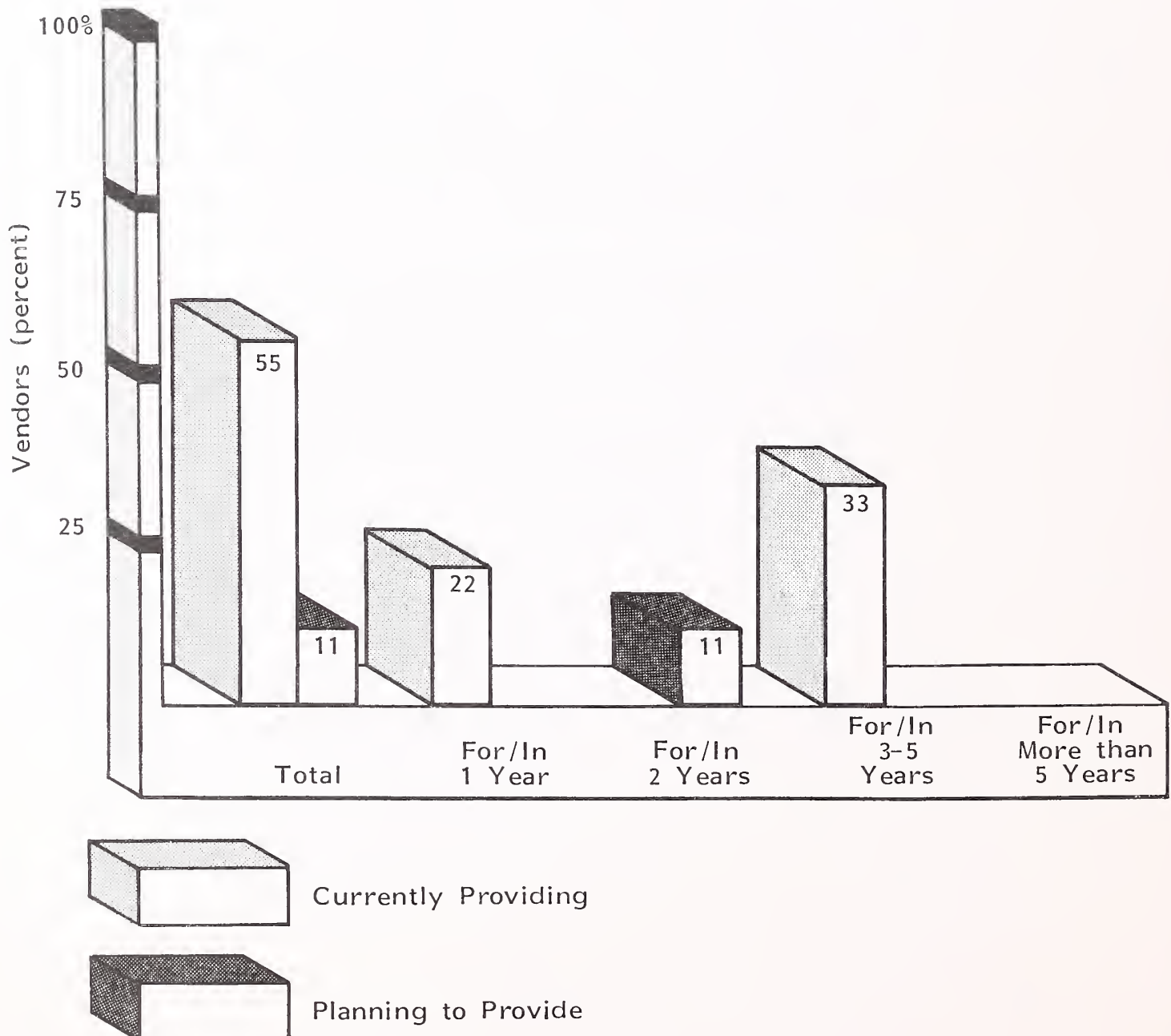


EXHIBIT III-11

CUSTOMERS' USE OF CENTRAL DISPATCH

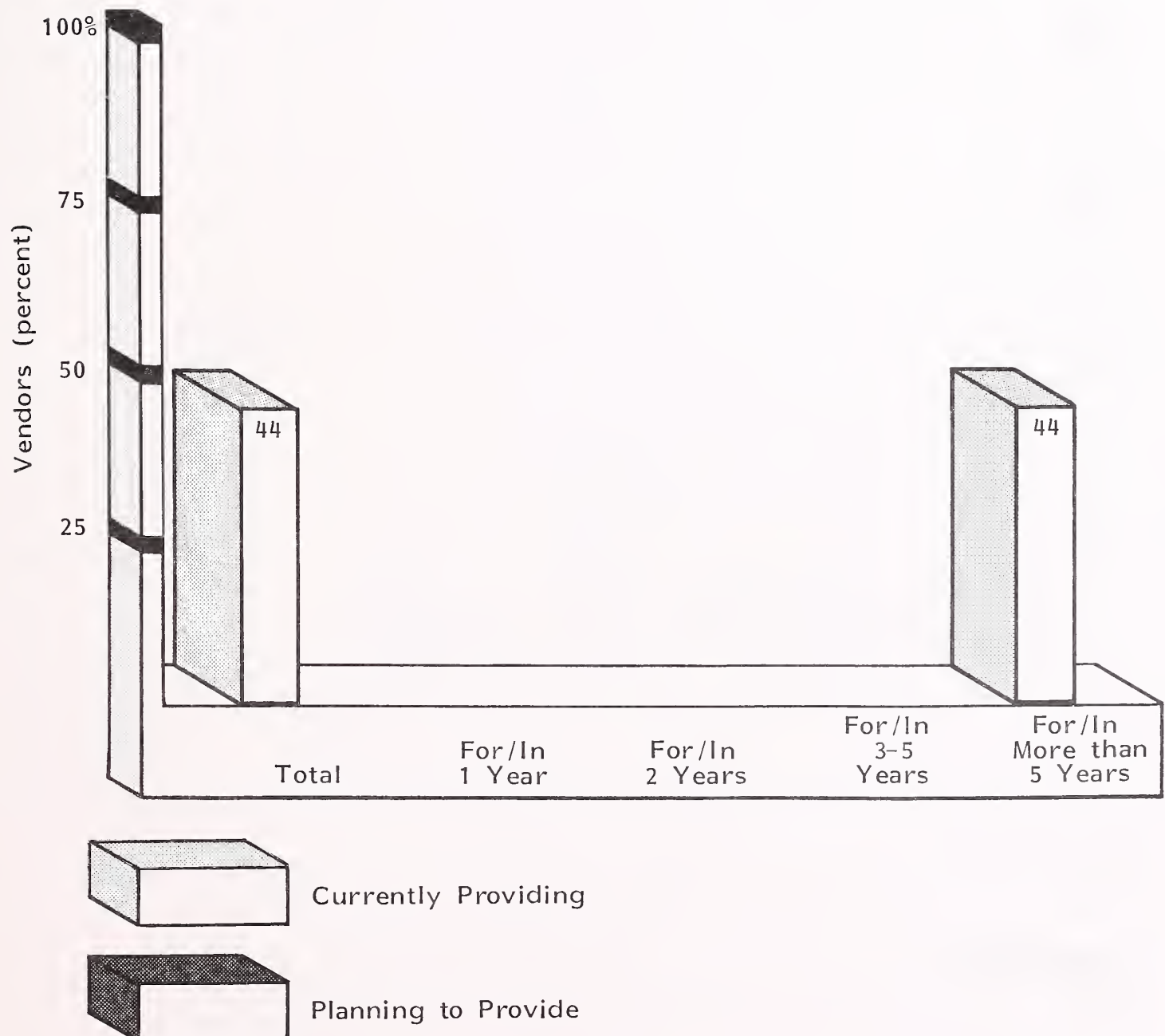
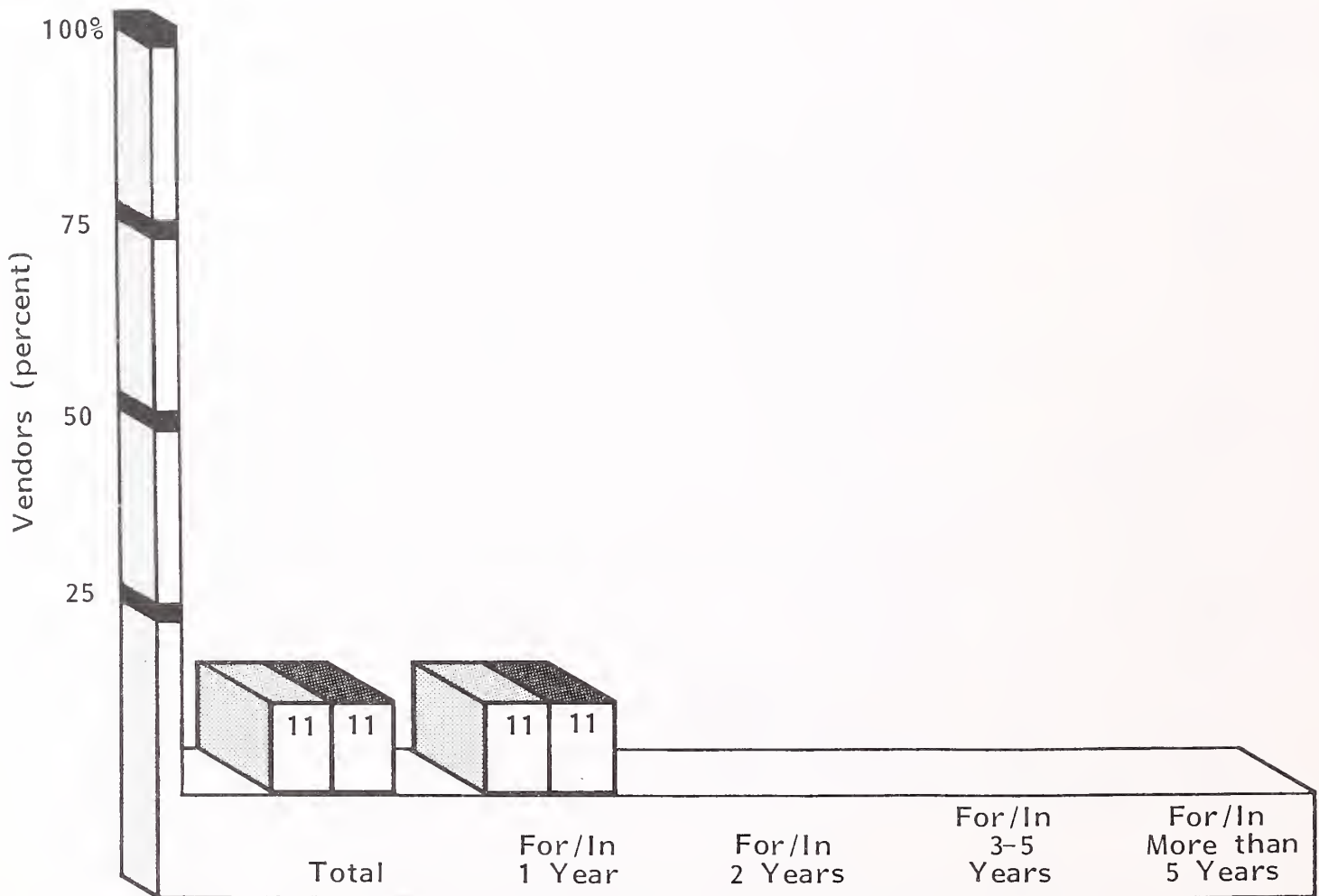


EXHIBIT III-12

CUSTOMERS' USE OF CARRY-IN SERVICES



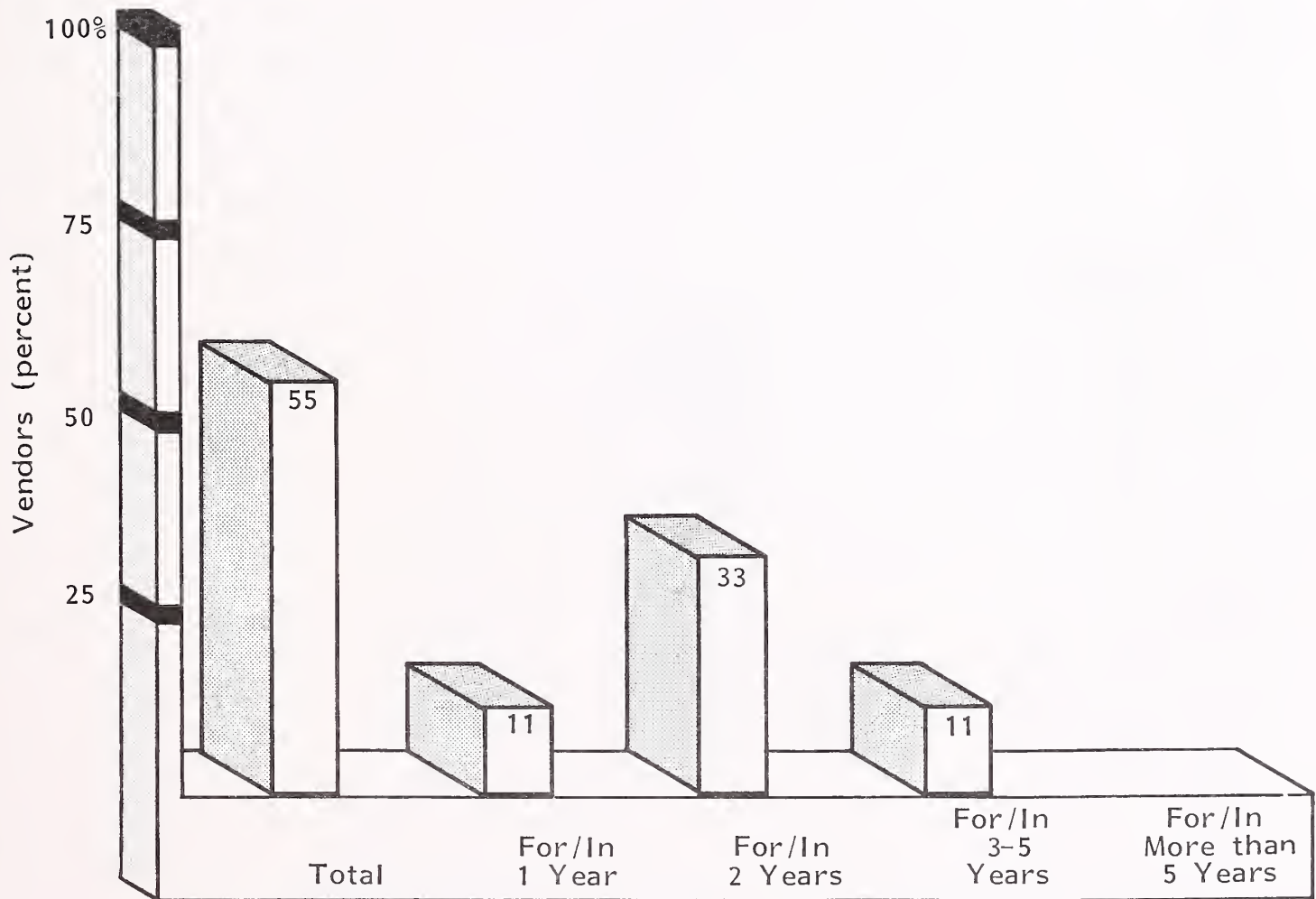
Currently Providing



Planning to Provide

EXHIBIT III-13

CUSTOMERS' USE OF MAIL-IN SERVICES

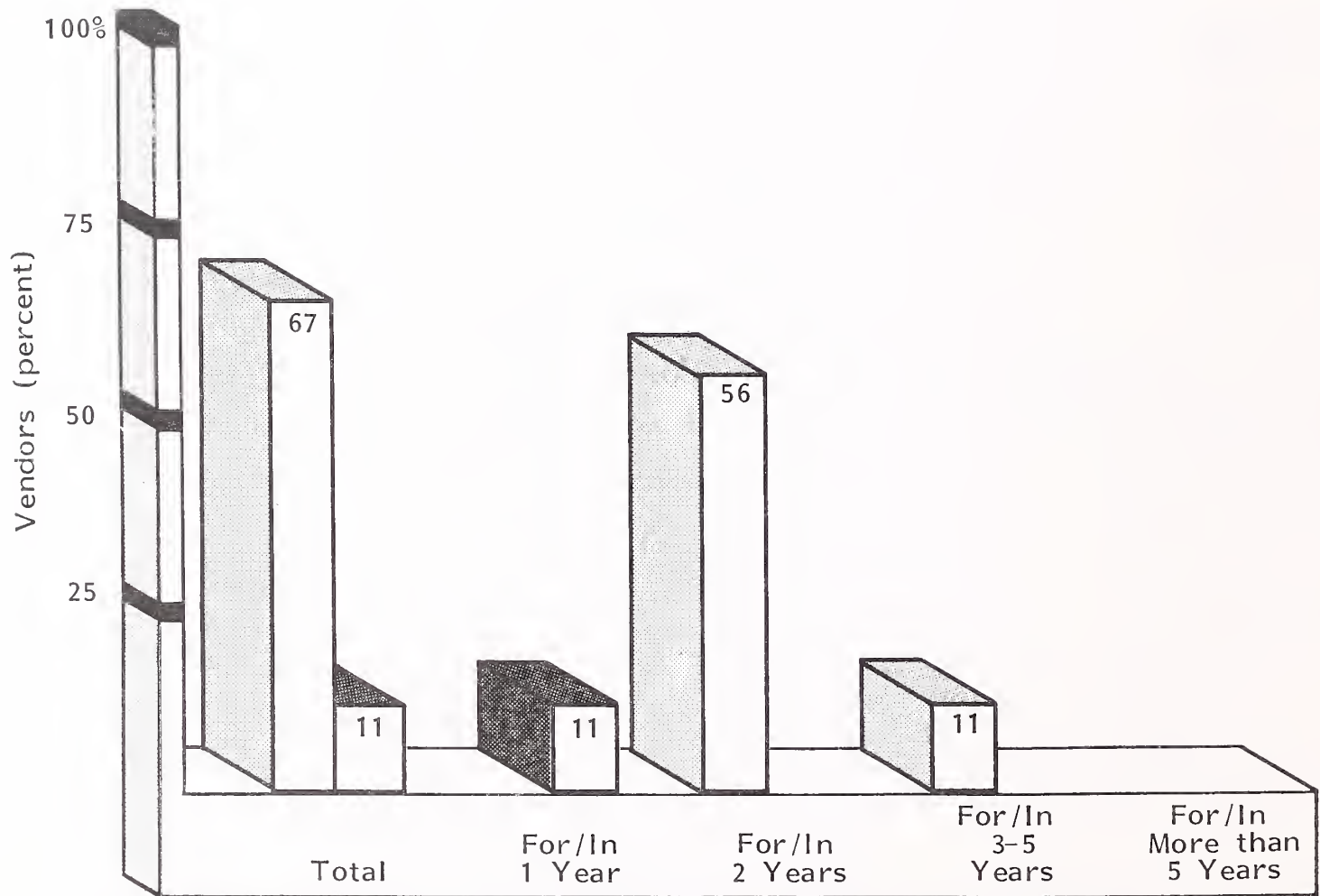


Currently Providing



Planning to Provide

CUSTOMERS' USE OF CUSTOMER-ASSISTED MAINTENANCE



Currently Providing



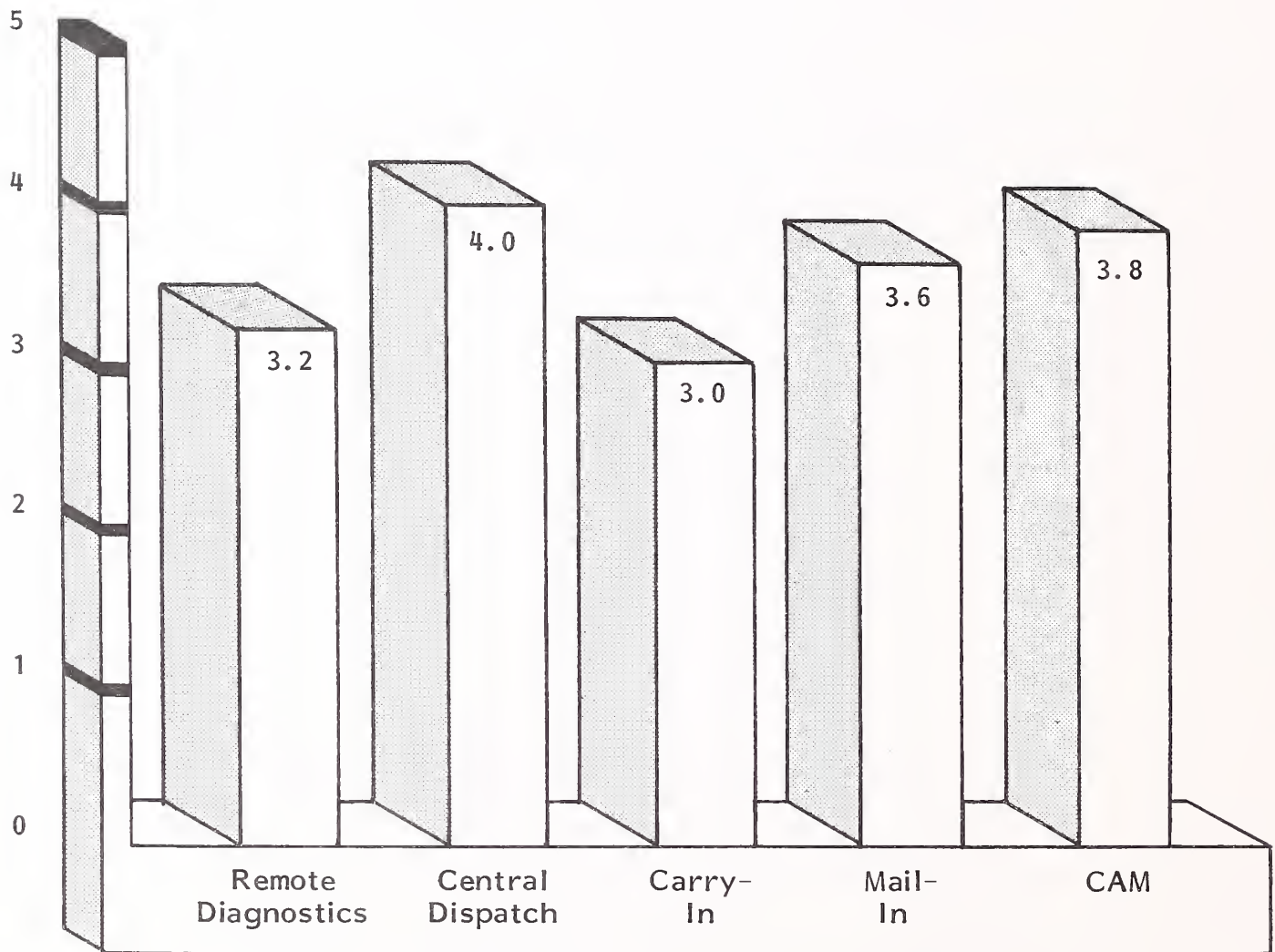
Planning to Provide

C. USER SATISFACTION WITH NEW SERVICE TECHNIQUES

- Exhibit III-15 illustrates user ratings of new service techniques. Users are particularly satisfied with central dispatch, mail-in, and customer-assisted maintenance, and are fairly satisfied with remote diagnostics and carry-in services. Users are pleased with the mail-in and customer-assisted maintenance despite the fact they are under-utilized services.
- A comparison of Exhibit III-15 with Exhibit III-16 (if the vendor rates are halved to regulate the two scales for each exhibit) reveals that vendor and user ratings correspond closely.
 - User:
 - Remote diagnostics - 3.2.
 - Central dispatch - 4.
 - Carry-in - 3.
 - Mail-in - 3.6.
 - Customer-assisted maintenance - 3.8.
 - Average - 3.5.
 - Vendor regulated:
 - Remote diagnostics - 3.4.
 - Central dispatch - 3.9.

EXHIBIT III-15

USERS' RATINGS OF SERVICES

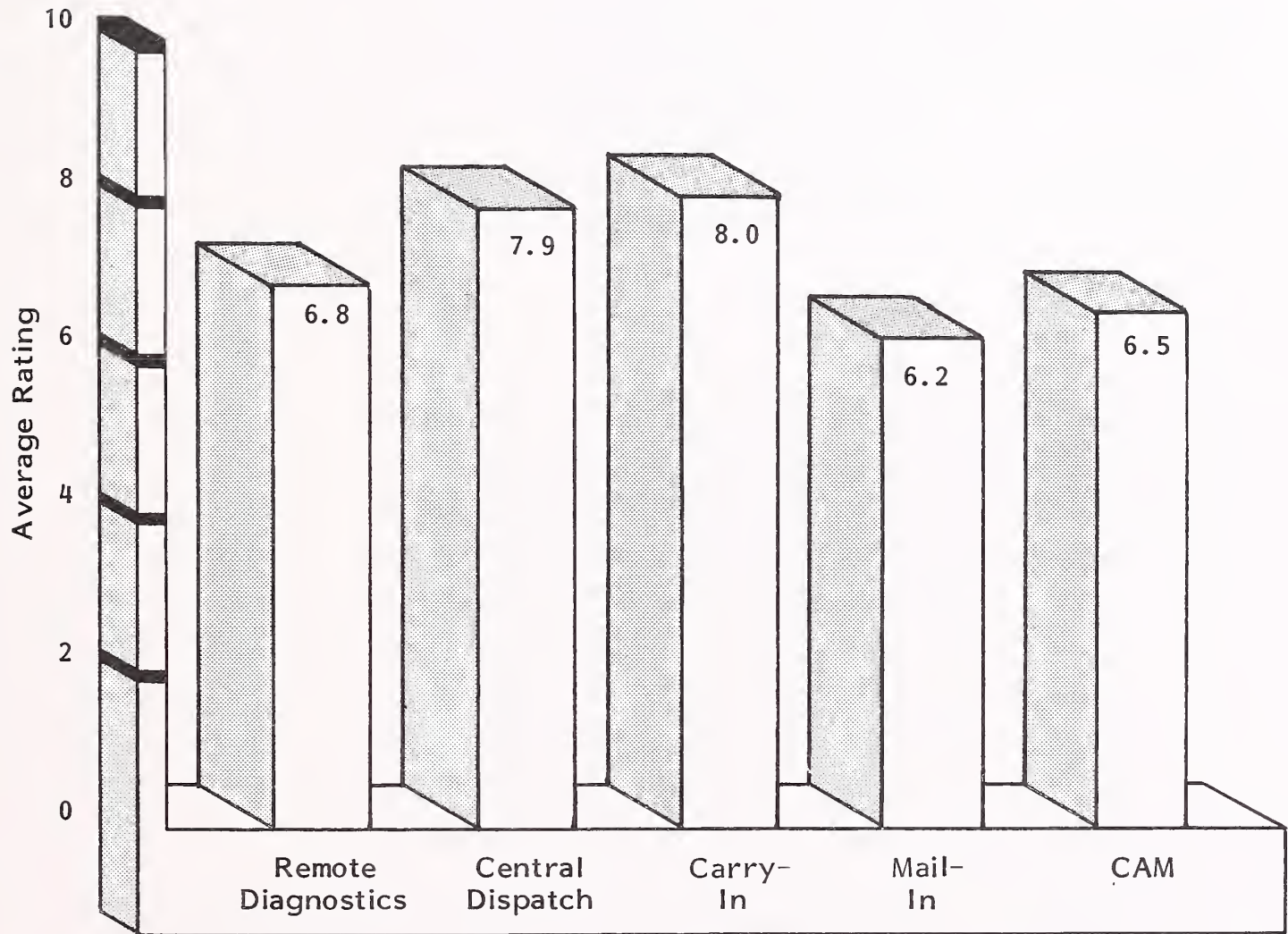


1 = Poor
5 = Very Good

Average = 3.5

EXHIBIT III-16

VENDORS' PERCEPTION OF
USERS' SATISFACTION WITH SERVICE



1 = Poor
10 = Very Good

Average = 7.1

- Carry-in - 4.
 - Mail-in - 3.1.
 - Customer assisted maintenance - 3.2.
 - Average - 3.5.
- Actual:
 - Remote diagnostics - (6.8).
 - Central dispatch - (7.9).
 - Carry-in - (8).
 - Mail-in - (6.2).
 - Customer assisted maintenance - (6.5).
- This suggests that vendors are fairly well attuned to user satisfaction. However, one must question whether vendors and users are evaluating the same aspects of the services. The next logical question is "What must vendors do to increase user satisfaction with new services?" In the following discussion the factors users consider important in rendering new services more acceptable are identified.
- Factors that would make each new service technique more acceptable to users fall into six groups:
 - Costs.
 - Users want to see how vendors justify service costs.

- They want services to be cost effective and time effective.
 - Users of remote diagnostics and customer-assisted maintenance would like reductions in costs. Remote diagnostics users think some of the savings vendors make on service expenditures through using remote diagnostics should accrue to them. Similarly, customer-assisted maintenance users feel that they should receive reductions in maintenance costs proportionate to the amount of time they spend assisting maintenance activities.
 - Customer-assisted maintenance users require formalized discounts.
- Service quality.
- Users from all the service groups (remote diagnostics, central dispatch, carry-in, mail-in, and customer-assisted maintenance) stressed the need for generally increased service quality and shorter delays and turnaround time for repairs. This was stressed strongly by mail-in users.
 - Remote dispatch users specified that service quality should be increased by increasing backup services and extending geographical coverage of maintenance centres in France in order to provide a standard quality of service (apparently Provence has very poor maintenance facilities) and by linking the operations of remote diagnostics and central dispatch more effectively.
- New service elements.
- Remote diagnostics users would like the following to become standard practice in remote diagnostics service: uptime guaran-

tees, "zero defects," more reliable equipment, and preventive maintenance.

- . Carry-in users would like the following to become standard practice in carry-in service: "new for old," i.e., immediate loan or replacement for the faulty part; pick up and delivery of parts with a turnaround time of 2-4 days.
- . Mail-in users would like the following to become standard practice in mail-in service: immediate loan or replacement for the faulty part; prepared boxes for fragile parts; storage improvement by providing flat-packed boxes and a spray foam to fill the area around the part to protect it; vendor negotiation with postal services to ensure that parts are handled carefully and not damaged in transit.
- Service organization and customer relations.
 - . Central dispatch users prefer to deal with a maximum of three engineers.
 - . Customer-assisted maintenance users would like to deal with the same engineers/technical staff when service is required.
 - . They stress the importance of consistency of technical staff and the benefits of engineers' being familiar and well-informed about the computer installation. Computer-assisted maintenance users consider this essential for good customer relations.
- User organization.

- Central dispatch users commented on the implications of central dispatch for their organizations. They think that vendors should interact with the organizations and help them to restructure for central dispatch. This would involve the selection of personnel who would be responsible for central dispatch in the organization and who would understand and control central dispatch procedures.
 - Carry-in users also commented on the need for user personnel to be trained for carry-in services.
- The major conclusions from this analysis of factors that would make new service techniques more acceptable to users include:
 - Users do not consider new service techniques to be cost effective because:
 - They are not fully exploiting available resources.
 - They consider current service techniques inefficient. (The emphasis on increasing service quality backed by constructive comment on new service elements is the basis for this conclusion.)
 - Vendors have not sold users on the benefits of new service techniques.
 - Users are having difficulty in participating in new service techniques because:
 - They are finding problems with the practical aspects of the new techniques.

- . Coupled with the points on use effectiveness, the above difficulties stress negative aspects of new service techniques and may demotivate users who wish to use new service techniques.
- Thus users are simply following impersonal procedures for maintenance, procedures set by vendors who have neither fully investigated nor planned the practical aspects of new service techniques. This comment echoes users' reasons for not using new service techniques. The problem is one of the practical implementation of new service techniques and the need for user friendly procedures.
- Despite the preceding problems, users gave a relatively high satisfaction rating on new service techniques. This suggests that users have accepted the concepts of the new techniques so the potential for new service techniques could be very high once vendors have corrected the "teething" problems.

D. USER-RECOMMENDED CHANGES AND IMPROVEMENTS FOR NEW SERVICE TECHNIQUES

- Users describe six ways for vendors to improve or change new services:
 - Costs.
 - . Customer-assisted maintenance users reemphasize the need to reduce maintenance costs in proportion to the amount of time they spend on customer-assisted maintenance activities.
 - Service quality.
 - . Remote diagnostics users wanted guarantees of immediate action at vendor service locations and feedback within half an

hour on the fault status so that alternative arrangements could be made. Central dispatch users followed this theme: they would like an instant report on the estimated time of arrival of an engineer. They would also like shorter arrival times when an engineer is required on-site, as well as hardware modifications for remote diagnostics.

- . Computer-assisted maintenance users request clearer manuals.
 - . Central dispatch users would like engineers to explain more clearly and avoid jargon.
- New service elements.
- . Remote diagnostics users emphasize the importance of telephone line clarity while mail-in users stressed the need for "no damage" guarantees from British Telecom.
 - . Remote diagnostics users would also like to have access to software originators or vendor software specialists when problems arise concerning packaged software.
 - . Remote diagnostics users would like preventive maintenance to be introduced as an internal part of computing equipment.
 - . A central dispatch user stresses the need for more efficient software updates.
 - . Customer-assisted maintenance and central dispatch users are interested in 24-hour service. Computer-assisted maintenance users would like a second shift for preventive maintenance. They find the 45 hours a week of preventive maintenance disruptive during normal working hours. The central dispatch user

operates two shifts and would like to have central dispatch facilities available for second shift personnel.

- Service organization and customer relations.
 - . Customer-assisted maintenance users reemphasize the need for continuity of engineers.
- Again, these suggestions relate mainly to the efficiency of the service offered by vendors and the need to tailor new service techniques to user requirements.

E. USER SUGGESTIONS FOR NEW SERVICE TECHNIQUES

- Here users present the need for more efficient hardware, software, and communications.
 - Hardware.
 - . Zero defect assurance.
 - . Failsafe systems - two of everything for automatic swapping.
 - . Nonvolatile memory.
 - . "Disposable" hardware - as hardware costs decrease, users foresee the time when it will cost less to replace a machine than to maintain and repair it.
 - . Improve hardware design and increase equipment reliability.
 - Software.

- Extend the tools available to customer-assisted maintenance users by providing a diagnostic program.
 - Improve software design and increase its reliability.
- Communications.
 - Improve communications services throughout Europe for baud rates.

F. USER WILLINGNESS TO PAY FOR NEW SERVICE TECHNIQUES

- Users are generally dissatisfied with the value they have received for new service techniques.
 - Users feel that maintenance charges should be lower and the benefits of cost savings derived from new service techniques and user participation should accrue to them.
 - However, in recognition of the value of new service techniques to their operations, 62.5% of users are prepared to meet increases in service charges of 5 to 15% if an overall better level of service is forthcoming.
 - The improved levels of service necessary for users to increase their budgets for maintenance are:
 - +5% Availability of remote diagnostics.
Extra equipment, e.g., modems.

- . +10-15% "Real" improvements in the service - more than just providing dual systems for increased reliability.
- . +15% Customer-assisted maintenance program to help reduce downtime.
Computer logging of temporary errors and maintenance to prevent downtime.
- One user is prepared to pay 5,000 pounds as a once-only charge for maintenance when purchasing new equipment.
- Users who do not specify how much they would pay comment that it depends on the cost and volume of equipment, but they would increase their budgets.
- It is remarkable that most of the improved levels of service cited by users are well within the capabilities of current vendor offerings in new service techniques.
- From these results it would appear that there is a large potential market for new service techniques that has remained untapped by vendors.

IV RECEPTIVITY, BENEFITS, PROBLEMS, AND SOLUTIONS REGARDING NEW MAINTENANCE TECHNIQUES

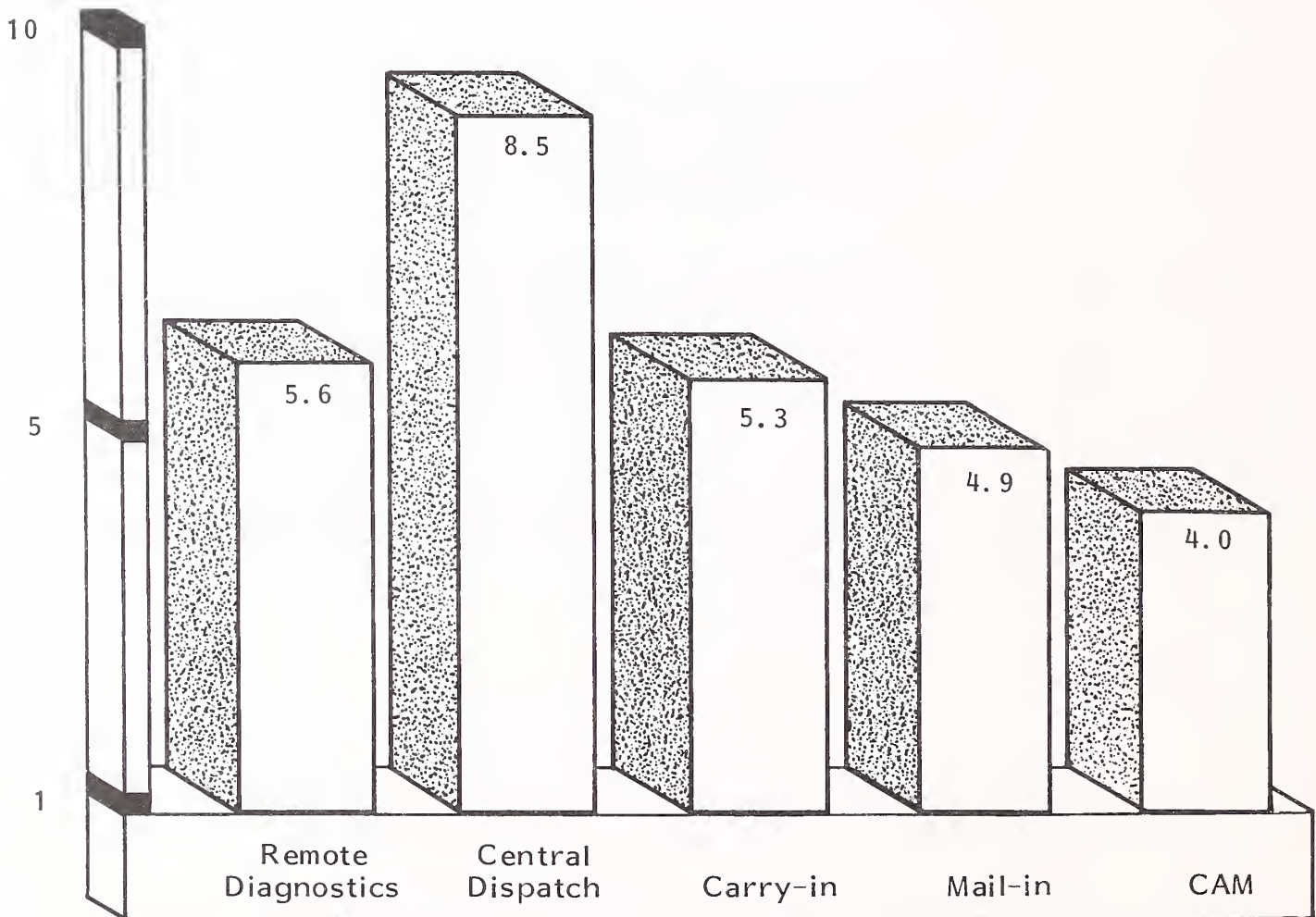
- Chapter III provided an analysis of the availability and use of new service techniques, user acceptance of and satisfaction with these techniques, and user suggestions on how the services could be made more acceptable to them.
- This chapter examines vendors' perception of users' receptiveness to new services, the major benefits of the services as perceived by users, and the factors that deny users enjoyment of the benefits of those services.

A. VENDORS' PERCEPTION OF CUSTOMER RECEPTIVENESS TOWARDS NEW SERVICE TECHNIQUES

- Exhibit IV-1 illustrates vendors' perceptions of customer receptiveness towards new service techniques. Users' receptiveness might be described as a function of the following elements:
 - The product's being what users think they need.
 - The product's being presented attractively to users.
 - Vendors proving that the product is capable of performing the required operations effectively.

EXHIBIT IV-1

VENDORS' PERCEPTION OF CUSTOMERS' RECEPTIVENESS TO SERVICES



1 = Indifferent
5 = Moderate Interest
10 = Very Interested

Average = 5.7

- Users' evaluations of the likelihood of the product being satisfactory in view of reports from sources who are actually using the product.
- Users' evaluations of vendor companies, their reputation, stability, and ability to maintain the equipment.
- Users are most receptive to central dispatch and least receptive to customer-assisted maintenance. This may reflect that central dispatch has been established for longer than the other services and involves the least user involvement.
- The ranking and rating of central dispatch and remote diagnostics as the two most accepted service techniques differentiates them from the other three services. This may reflect that, in most cases, central dispatch and remote diagnostics are not optional services, while carry-in, mail-in, and customer-assisted maintenance are alternative services.
 - The user must choose to use these services and be convinced to commit expenditures to them.
 - It could be that users are slower to accept these three service techniques rather than that they are uninterested in them.

B. BENEFITS OF NEW SERVICE TECHNIQUES - USERS

- Exhibit IV-2 categorizes the benefits of new service techniques into six groups: speed, cost effectiveness, access to resources, efficiency of service, efficiency of personnel, and negative aspects. Its contents are a guideline for vendors to identify the benefits that vendors do not perceive.

EXHIBIT IV-2

MAJOR BENEFITS OF NEW SERVICE TECHNIQUES AS PERCEIVED BY USERS

DESCRIPTION	REMOTE DIAGNOSTICS	CENTRAL DISPATCH	CARRY- IN	MAIL- IN	CAM
Speed	Saves time. Fast repair. Fast solution. Speed of downloading, i.e., fast response.	More significant than remote diagnostics in that instant updates are transmitted.		Speed.	Doubles time saved.
Cost effectiveness	Cost savings.			Reduces costs (depends on size of company). Reduces investment in spare parts.	Reduces costs.
Efficiency of service	Reduces breakdowns. Better preventive maintenance. Early identification of faults. Maximum access to equipment. Easy to use. Improved uptime.	Total access. Access to more resources if the maintenance network is good. 24 hour, 7 day service. One telephone number. Decreases down- time dramatically. Backup is good. Safety net.	Availability of spares.	72- hour turnaround. Pick up and delivery OK if piece of equipment not used all the time. Ease of access to maintenance centre (user near railway station). Availability of service.	Quicker receipt of spare parts.
Efficiency of personnel				Motivates staff to diagnose faults. Engineer organizes mail-in. Vendor organizes mail-in.	Freedom of operation increases staff satisfaction and motivation.
Access to resources	Availability of specialists to diagnose problems. Distribution of expertise. Only effective if linked to central dispatch.				
Negative aspects	Benefits vendor in that fewer skilled staff are needed.		Machine is "out of our hands." Easier for supplier to schedule repairs.	Not a good alternative to downloading. Benefits supplier, i.e., repair scheduling. Cannot disconnect parts in-house.	No benefits.

- It appears that users are very positive and reasonably well informed about the benefits of remote diagnostics, central dispatch, and mail-in, which, incidentally, are the services with the highest rate of use in the vendor sample. Nevertheless, users make very few remarks about carry-in and customer-assisted maintenance, which suggests that they are not really aware of the benefits of these two services. Vendors should note that voids left by inadequate education are being filled with negative attitudes by some users.

C. PROBLEMS

- Problems actually experienced by users are categorized for new services in Exhibit IV-3. These may give an indication of why few carry-in and customer-assisted maintenance benefits were noted earlier. Cost and service efficiency appear to be the main problems for carry-in and customer-assisted maintenance users.
- For the other services (remote diagnostics, central dispatch) service efficiency relating to the dispatch of engineers, communications with them, and a sense of a possible loss of contact with the local FE are the main problems. They want the local FE to be in charge of maintenance, not their operators. They would also like to have the same engineer each visit, someone whom they believe to have an understanding of the history of the installation.
- The problems experienced with mail-in services are essentially practical ones that need the cooperation of national mail and postal services.
- Exhibit IV-4 traces a variable range of problems relating to newer services as experienced by vendors. These problems usually relate to: the product, costs, practicality, legality, security, and customers.

EXHIBIT IV-3

PROBLEMS EXPERIENCED BY USERS

DESCRIPTION	REMOTE DIAGNOSTICS	CENTRAL DISPATCH	CARRY- IN	MAIL- IN	CAM
Speed					
Costs					
Efficiency of service	With engineer - after the fault is diagnosed still need local technical service to conduct repairs.	Need to maintain high stock levels of parts. Time delay changing schedules - prescheduled preventive maintenance given second priority if there is urgent problem elsewhere.	Disruption of removing machine - need replacement immediately. Need spare parts. Two week turnaround needs to be reduced to 1-2 days.		Need to invest in extra devices and duplicate machines. Two-hour delay before engineer dispatched. Need manuals designed for easy reference and understanding. Lack of communications. Time lost waiting for engineer to arrive.
Efficiency of personnel	Poor caliber of engineers. Lack of communication.	Unavailability of engineers. Rate of change of personnel. Expertise not always available. Lack of continuity of personnel reduces efficiency of service.			
Attitudes					
Practical problems	Corruption of telephone lines - only 90% clarity.		Distance from maintenance center. Location of maintenance center.	Prefer not to be responsible for equipment. Cannot disconnect parts in-house. Unreliability of postal services. Unreliability of rail services.	Prefer not to be responsible for equipment.

DIFFICULTIES FACING VENDORS

NATURE OF PROBLEM	REMOTE DIAGNOSTICS	CENTRAL DISPATCH	CARRY-IN	MAIL-IN	CAM
Product	Need for diagnostics to be user-friendly.		Portability of equipment.	Shipping costs.	Erosion of revenue if CAM threatens maintenance contracts.
Costs	High cost in investing in equipment, spares for swap-out for European markets.	Difficult to justify high costs when equipment is highly reliable.		Packaging of equipment. Damage in transit.	
Practical	Lack of toll-free telephone line in Italy. Poor communications services in Germany and France.			Customs and excise on freight. Much paper work and bureaucracy. Export and import regulations.	
Legal					
Security	Large accounts like NATO need special security procedures.				Security of data, etc.
Users	In Germany - hard to trace person who can authorize changes. Cultural problems in third-world countries, e.g., Saudi Arabia, Yemen, Nigeria. Users want to identify with engineer. Combined word processing and data processing office environments. Secretaries simply switch terminals and are not interested in repair. Vendor prefers not to encourage remote diagnostics for this environment. Problems depend on sophistication and size of client organization.	Transient staff in typing pools. Difficult to train. Users accept service reluctantly - they would prefer to have the expertise in-house. Word processing staff not as flexible as DP staff. Lack expertise.	As desktop terminal and personal computer markets grow, there will be a movement from industrial to commercial applications where users are less able to conduct maintenance. Need for refined consultation techniques to develop user rapport. Developing awareness of low-cost equipment market.		

D. SOLUTIONS

- Solutions to problems of bringing newer service techniques to the marketplace are explicitly and implicitly provided by users in their responses to new techniques. Users are concerned with five important factors, all of which relate to vendor endeavors to implement new service strategies.
 - Cost is a primary factor. If the user sees a cost improvement, he is sold on the new technique.
 - Quality of service increases in importance to the user. If he senses an enhancement of quality he is more prone to accept the technique responsible for it.
 - New service elements, closely related to techniques, are intriguing to some users. These involve uptime guarantees, exchange programs, and the like.
 - Vendor and user relations are another key consideration for users when they evaluate new service techniques. They are anxious to improve relations, and a new technique that hints of causing friction may not be accepted.
- Exhibit IV-5 summarizes the solutions to problems relating to new services, based on users' opinions.

USER SOLUTIONS TO MAKING SERVICES ACCEPTABLE

DESCRIPTION	COSTS	SERVICE QUALITY	NEW ELEMENTS	SERVICE ORGANIZATION AND CUSTOMER RELATIONS	USER ORGANIZATION
Factors to make new services acceptable	Cost justification. Cost-effective, time-effective services. Cost reductions (especially remote diagnostics and CAM). Formalized discounts (CAM).	Improve quality. Shorter delays plus turnaround time (very important to mail-in). Increase backup services (remote diagnostics). Extend geographical coverage (remote diagnostics). Link remote diagnostics and central dispatch more effectively.	Uptime guarantees (remote diagnostics). Zero defects (remote diagnostics). Preventive maintenance (remote diagnostics). New for old (carry-in). Pickup and delivery. Turnaround 2-4 days (carry-in). New for old (mail-in). Prepared boxes, flat-packed boxes and foam to protect equipment (mail-in). Negotiations with postal services re guarantees against damage (mail-in).	Max three engineers to deal with (central dispatch). Same engineers (CAM). Consistency of engineers essential for good customer relations (CAM).	Vendor involvement in helping user organizations restructure to introduce function with responsibility for central dispatch (central dispatch users). User personnel training (carry-in).
Fundamental changes and improvements	Cost reductions (CAM).	Guarantee immediate action and feedback in half hour of fault status (remote diagnostics). Instant report on ETA of engineer (central dispatch). Shorter delays in engineer arrival (remote diagnostics). Hardware modifications (remote diagnostics). Clearer manuals (CAM). Engineers to avoid jargon (central dispatch).	Improve telephone line clarity (remote diagnostics). "No damage" guarantees from British telecom (mail-in). Access to software originators. Preventive maintenance for internal part of equipment (remote diagnostics). Increased efficiency on software update (central dispatch). 24-hour service (central dispatch and CAM).	Continuity of engineers (CAM).	
New service techniques		Hardware: Zero defects assurance. Non-volatile memory. "Disposable" hardware. Improved design and reliability. Software: Improved design and reliability. Communications: Improve communication services throughout Europe re band rates, etc.	Software: Diagnostic program for use by users.		

MANAGEMENT PROGRAMS: Designed for clients with a continuing need for information about a range of subjects in a given area.

- Management Planning Program in Information Systems - Provides managers of large computer/communications facilities with timely and accurate information on developments which affect today's decisions and plans for the future.
- Management Planning Program for the Information Services Industry - Provides market forecasts and business information to software and processing services companies to support planning and product decisions.
- Company Analysis and Monitoring Program for the Information Services Industry - Provides immediate access to detailed information on over 3,000 companies offering turnkey systems, software and processing services in the U.S. and Canada.
- Management Planning Program in Field Service - Provides senior field service managers in the U.S. and in Europe with basic information and data to support their planning and operational decisions.
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- Selling Personal Computers to Large Corporations
- Improving the Productivity of Systems and Software Implementation
- User Communication Networks and Needs
- Improving the Productivity of Engineering and Manufacturing Using CAD/CAM

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- Determination of the U.S. market for small computer systems in 1985.
- Analysis of the opportunities and problems associated with field service capabilities for CAD/CAM systems.
- Analysis of the market potential for third-party maintenance.
- 1982 ADAPSO Survey of the Computer Services Industry.
- Evaluation of the current status and future trends of software terms and conditions.
- Analysis and forecast of user self-maintenance for a vendor's line of equipment.

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